



**ENVIRONMENTAL PROTECTION AGENCY**

**40 CFR Part 52**

**[EPA-R01-OAR-2009-0689; A-1-FRL-9638-7]**

**Approval and Promulgation of Air Quality Implementation Plans; Vermont; Regional Haze**

**AGENCY:** Environmental Protection Agency (EPA).

**ACTION:** Proposed rule.

**SUMMARY:** EPA is proposing approval of a revision to the Vermont State Implementation Plan (SIP) submitted by the Vermont Department of Environmental Conservation (VT DEC) on August 26, 2009, with a supplemental submittal on January 3, 2012, that addresses regional haze for the first planning period from 2008 through 2018. This revision addresses the requirements of the Clean Air Act (CAA) and EPA's rules that require States to prevent any future, and remedy any existing, manmade impairment of visibility in mandatory Class I areas (also referred to as the "regional haze program"). States are required to assure reasonable progress toward the national goal of achieving natural visibility conditions in Class I areas.

**DATES:** Written comments must be received on or before **[Insert date 30 days after publication in the Federal Register]**.

**ADDRESSES:** Submit your comments, identified by Docket ID Number EPA-R01-OAR-2009-0689 by one of the following methods:

1. [www.regulations.gov](http://www.regulations.gov) : Follow the on-line instructions for submitting comments.
2. E-mail: [arnold.anne@epa.gov](mailto:arnold.anne@epa.gov)

3. Fax: (617) 918-0047.
4. Mail: “Docket Identification Number EPA-R01-OAR-2009-0631,” Anne Arnold, U.S. Environmental Protection Agency, EPA New England Regional Office, Office of Ecosystem Protection, Air Quality Planning Unit, 5 Post Office Square - Suite 100, (Mail code OEP05-2), Boston, MA 02109 - 3912.
5. Hand Delivery or Courier. Deliver your comments to: Anne Arnold, Manager, Air Quality Planning Unit, U.S. Environmental Protection Agency, EPA New England Regional Office, Office of Ecosystem Protection, Air Quality Planning Unit, 5 Post Office Square - Suite 100, (mail code OEP05-2), Boston, MA 02109 - 3912. Such deliveries are only accepted during the Regional Office’s normal hours of operation. The Regional Office’s official hours of business are Monday through Friday, 8:30 to 4:30, excluding legal holidays.

*Instructions:* Direct your comments to Docket ID No. EPA-R01-OAR-2009-0689. EPA's policy is that all comments received will be included in the public docket without change and may be made available online at [www.regulations.gov](http://www.regulations.gov), including any personal information provided, unless the comment includes information claimed to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Do not submit through [www.regulations.gov](http://www.regulations.gov), or e-mail, information that you consider to be CBI or otherwise protected. The [www.regulations.gov](http://www.regulations.gov) website is an “anonymous access” system, which means EPA will not know your identity or contact information unless you provide it in the body of your comment. If you send an e-mail comment directly to EPA without going through [www.regulations.gov](http://www.regulations.gov) your e-mail address will be automatically captured and included as part of the comment that is placed

in the public docket and made available on the Internet. If you submit an electronic comment, EPA recommends that you include your name and other contact information in the body of your comment and with any disk or CD-ROM you submit. If EPA cannot read your comment due to technical difficulties and cannot contact you for clarification, EPA may not be able to consider your comment. Electronic files should avoid the use of special characters, any form of encryption, and be free of any defects or viruses.

*Docket:* All documents in the electronic docket are listed in the [www.regulations.gov](http://www.regulations.gov) index.

Although listed in the index, some information is not publicly available, i.e., CBI or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the Internet and will be publicly available only in hard copy form.

Publicly available docket materials are available either electronically in [www.regulations.gov](http://www.regulations.gov) or in hard copy at Office of Ecosystem Protection, U.S. Environmental Protection Agency, EPA New England Regional Office, Office of Ecosystem Protection, Air Quality Planning Unit, 5 Post Office Square - Suite 100, Boston, MA. EPA requests that if at all possible, you contact the contact listed in the **FOR FURTHER INFORMATION CONTACT** section to schedule your inspection. The Regional Office's official hours of business are Monday through Friday, 8:30 to 4:30, excluding legal holidays.

In addition, copies of the State submittal are also available for public inspection during normal business hours, by appointment at the Air Pollution Control Division, Agency of Natural Resources, Building 3 South, 103 South Main Street, Waterbury, VT 05676.

**FOR FURTHER INFORMATION CONTACT:** Anne McWilliams, Air Quality Unit, U.S. Environmental Protection Agency, EPA New England Regional Office, 5 Post Office Square – Suite 100, (Mail Code OEP05-02), Boston, MA 02109 – 3912, telephone number (617) 918-1697, fax number (617) 918-0697, e-mail [mcwilliams.anne@epa.gov](mailto:mcwilliams.anne@epa.gov)

## **SUPPLEMENTARY INFORMATION:**

### **Table of Contents**

- I. What is the Background for EPA’s Proposed Action?
  - A. The Regional Haze Problem
  - B. Background Information
  - C. Roles of Agencies in Addressing Regional Haze
- II. What are the Requirements for the Regional Haze SIPs?
  - A. The CAA and the Regional Haze Rule (RHR)
  - B. Determination of Baseline, Natural, and Current Visibility Conditions
  - C. Determination of Reasonable Progress Goals (RPGs)
  - D. Best Available Retrofit Technology (BART)
  - E. Long-Term Strategy (LTS)
  - F. Coordinating Regional Haze and Reasonably Attributable Visibility Impairment (RAVI)
    - LTS
  - G. Monitoring Strategy and Other Implementation Plan Requirements
  - H. Consultation with States and Federal Land Managers (FLMs)
- III. What is EPA’s Analysis of Vermont’s Regional Haze SIP Submittal?
  - A. Vermont’s Affected Class I Area
  - B. Determination of Baseline, Natural and Current Visibility Conditions

1. Estimating Natural Visibility Conditions
2. Estimating Baseline Conditions
3. Summary of Baseline and Natural Conditions
4. Uniform Rate of Progress

C. Reasonable Progress Goals

1. Relative Contributions of Pollutants to Visibility Impairments
2. Procedure for Identifying Sources to Evaluate for Reasonable Progress Controls
3. Application of the Four Clean Air Act Factors in the Reasonable Progress Analysis

D. BART

E. Long-Term Strategy

1. Emissions Inventory for 2018 with Federal and State Control Requirements
2. Modeling to Support the LTS and Determine Visibility Improvement for Uniform Rate of Progress
3. Meeting the MANE-VU “Ask”
4. Additional Considerations for the LTS

F. Consultation with States and Federal Land Managers

G. Monitoring Strategy and Other Implementation Plan Requirements

H. Periodic SIP Revisions and Five-Year Progress Reports

IV. What Action is EPA Proposing to Take?

V. Statutory and Executive Order Reviews

Throughout this document, wherever “we,” “us,” or “our” is used, we mean the EPA.

**I. What is the Background for EPA’s Proposed Action?**

## **A. The Regional Haze Problem**

Regional haze is visibility impairment that is produced by a multitude of sources and activities which are located across a broad geographic area and emit fine particles and their precursors (e.g., sulfur dioxide, nitrogen oxides, and in some cases, ammonia and volatile organic compounds). Fine particle precursors react in the atmosphere to form fine particulate matter (PM<sub>2.5</sub>) (e.g., sulfates, nitrates, organic carbon, elemental carbon, and soil dust), which also impair visibility by scattering and absorbing light. Visibility impairment reduces the clarity, color, and visible distance that one can see. PM<sub>2.5</sub> can also cause serious health effects and mortality in humans and contributes to environmental effects such as acid deposition.

Data from the existing visibility monitoring network, the “Interagency Monitoring of Protected Visual Environments” (IMPROVE) monitoring network, show that visibility impairment caused by air pollution occurs virtually all the time at most national park and wilderness areas. The average visual range in many Class I areas (i.e., national parks and memorial parks, wilderness areas, and international parks meeting certain size criteria) in the Western United States is 100-150 kilometers, or about one-half to two-thirds of the visual range that would exist without manmade air pollution. In most of the eastern Class I areas of the United States, the average visual range is less than 30 kilometers, or about one-fifth of the visual range that would exist under estimated natural conditions. See 64 FR 35715, (July 1, 1999).

## **B. Background Information**

In section 169A(a)(1) of the 1977 Amendments to the CAA, Congress created a program for protecting visibility in the nation’s national parks and wilderness areas. This section of the CAA

establishes as a national goal the “prevention of any future, and the remedying of any existing, impairment of visibility in mandatory Class I Federal areas<sup>1</sup> which impairment results from manmade air pollution.” On December 2, 1980, EPA promulgated regulations to address visibility impairment in Class I areas that is “reasonably attributable” to a single source or small group of sources, i.e., “reasonably attributable visibility impairment” (RAVI). See 45 FR 80084 (Dec. 2, 1980). These regulations represented the first phase in addressing visibility impairment. EPA deferred action on regional haze that emanates from a variety of sources until monitoring, modeling and scientific knowledge about the relationships between pollutants and visibility impairment were improved.

Congress added section 169B to the CAA in 1990 to address regional haze issues. EPA promulgated a rule to address regional haze on July 1, 1999 (64 FR 35714), the Regional Haze Rule. The Regional Haze Rule revised the existing visibility regulations to integrate into the regulation provisions addressing regional haze impairment and established a comprehensive visibility protection program for Class I areas. The requirements for regional haze, found at 40 CFR 51.308 and 51.309, are included in EPA’s visibility protection regulations at 40 CFR 51.300-309. Some of the main elements of the regional haze requirements are summarized in Section II. The requirement to submit a regional haze SIP applies to all 50 States, the District of

---

<sup>1</sup> Areas designated as mandatory Class I Federal areas consist of national parks exceeding 6000 acres, wilderness areas and national memorial parks exceeding 5000 acres, and all international parks that were in existence on August 7, 1977 (42 U.S.C. 7472(a)). In accordance with section 169A of the CAA, EPA, in consultation with the Department of Interior, promulgated a list of 156 areas where visibility is identified as an important value (44 FR 69122, November 30, 1979). The extent of a mandatory Class I area includes subsequent changes in boundaries, such as park expansions (42 U.S.C. 7472(a)). Although States and Tribes may designate as Class I additional areas which they consider to have visibility as an important value, the requirements of the visibility program set forth in section 169A of the CAA apply only to “mandatory Class I Federal areas.” Each mandatory Class I Federal area is the responsibility of a “Federal Land Manager” (FLM). (42 U.S.C. 7602(i)). When we use the term “Class I area” in this action, we mean a “mandatory Class I Federal area.”

Columbia and the Virgin Islands. Forty CFR 51.308(b) requires States to submit the first implementation plan addressing regional haze visibility impairment no later than December 17, 2007. On January 15, 2009, EPA found that 37 States, the District of Columbia and the U.S. Virgin Islands failed to submit this required implementation plan. See 74 FR 2392, (Jan. 15, 2009). In particular, EPA found that Vermont failed to submit a plan that met the requirements of 40 CFR 51.308. See 74 FR 2393. On August 26, 2009, VT DEC submitted revisions to the Vermont SIP to address regional haze as required by 40 CFR 51.308. Supplemental documentation was submitted on January 3, 2012. EPA has reviewed Vermont's submittal and proposes to find that it is consistent with the requirements of 40 CFR 51.308 outlined in Section II.

### **C. Roles of Agencies in Addressing Regional Haze**

Successful implementation of the regional haze program will require long-term regional coordination among States, tribal governments, and various federal agencies. As noted above, pollution affecting the air quality in Class I areas can be transported over long distances, even hundreds of kilometers. Therefore, to effectively address the problem of visibility impairment in Class I areas, States need to develop strategies in coordination with one another, taking into account the effect of emissions from one jurisdiction on the air quality in another.

Because the pollutants that lead to regional haze can originate from sources located across broad geographic areas, EPA has encouraged the States and Tribes across the United States to address visibility impairment from a regional perspective. Five regional planning organizations (RPOs) were developed to address regional haze and related issues. The RPOs first evaluated



technical information to better understand how their States and Tribes impact Class I areas across the country, and then pursued the development of regional strategies to reduce emissions of PM<sub>2.5</sub> and other pollutants leading to regional haze.

The Mid-Atlantic/Northeast Visibility Union (MANE-VU) RPO is a collaborative effort of State governments, Tribal governments, and various federal agencies established to initiate and coordinate activities associated with the management of regional haze, visibility and other air quality issues in the Northeastern United States. Member State and Tribal governments include: Connecticut, Delaware, the District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Penobscot Indian Nation, Rhode Island, and Vermont.

## **II. What Are the Requirements for Regional Haze SIPs?**

### **A. The CAA and the Regional Haze Rule (RHR)**

Regional haze SIPs must assure reasonable progress towards the national goal of achieving natural visibility conditions in Class I areas. Section 169A of the CAA and EPA's implementing regulations require States to establish long-term strategies for making reasonable progress toward meeting this goal. Implementation plans must also give specific attention to certain stationary sources that were in existence on August 7, 1977, but were not in operation before August 7, 1962, and require these sources, where appropriate, to install Best Available Retrofit Technology (BART) controls for the purpose of eliminating or reducing visibility impairment. The specific regional haze SIP requirements are discussed in further detail below.

### **B. Determination of Baseline, Natural, and Current Visibility Conditions**

The RHR establishes the deciview (dv) as the principal metric for measuring visibility. This visibility metric expresses uniform changes in haziness in terms of common increments across the entire range of visibility conditions, from pristine to extremely hazy conditions. Visibility is determined by measuring the visual range (or deciview), which is the greatest distance, in kilometers or miles, at which a dark object can be viewed against the sky. The deciview is a useful measure for tracking progress in improving visibility, because each deciview change is an equal incremental change in visibility perceived by the human eye. Most people can detect a change in visibility at one deciview.<sup>2</sup>

The deciview is used in expressing Reasonable Progress Goals (RPGs) (which are interim visibility goals towards meeting the national visibility goal), defining baseline, current, and natural conditions, and tracking changes in visibility. The regional haze SIPs must contain measures that ensure “reasonable progress” toward the national goal of preventing and remedying visibility impairment in Class I areas caused by manmade air pollution by reducing anthropogenic emissions that cause regional haze. The national goal is a return to natural conditions, i.e., manmade sources of air pollution would no longer impair visibility in Class I areas.

To track changes in visibility over time at each of the 156 Class I areas covered by the visibility program and as part of the process for determining reasonable progress, States must calculate the degree of existing visibility impairment at each Class I area within the State at the time of each regional haze SIP submittal and periodically review progress every five years

---

<sup>2</sup> The preamble to the RHR provides additional details about the deciview. See 64 FR 35714, 35725 (July 1, 1999).

midway through each 10-year planning period. To do this, the RHR requires States to determine the degree of impairment (in deciviews) for the average of the 20 percent least impaired (“best”) and 20 percent most impaired (“worst”) visibility days over a specified time period at each of their Class I areas. In addition, States must also develop an estimate of natural visibility conditions for the purposes of comparing progress toward the national goal. Natural visibility is determined by estimating the natural concentrations of pollutants that cause visibility impairment and then calculating total light extinction based on those estimates. EPA has provided guidance to States regarding how to calculate baseline, natural, and current visibility conditions in documents titled, *Guidance for Estimating Natural Visibility conditions under the Regional Haze Rule*, September 2003, (EPA-454/B-03-005, available at [www.epa.gov/ttncaaa1/t1/memoranda/rh\\_envcurhr\\_gd.pdf](http://www.epa.gov/ttncaaa1/t1/memoranda/rh_envcurhr_gd.pdf)), (hereinafter referred to as “EPA’s 2003 Natural Visibility Guidance”), and *Guidance for Tracking Progress Under the Regional Haze Rule*, September 2003 (EPA-454/B-03-004, available at [www.epa.gov/ttncaaa1/t1/memoranda/rh\\_tpurhr\\_gd.pdf](http://www.epa.gov/ttncaaa1/t1/memoranda/rh_tpurhr_gd.pdf)), (hereinafter referred to as “EPA’s 2003 Tracking Progress Guidance”).

For the first regional haze SIPs that were due by December 17, 2007, “baseline visibility conditions” were the starting points for assessing “current” visibility impairment. Baseline visibility conditions represent the degree of impairment for the 20 percent least impaired days and 20 percent most impaired days at the time the regional haze program was established. Using monitoring data from 2000 through 2004, States are required to calculate the average degree of visibility impairment for each Class I area within the State, based on the average of annual values over the five year period. The comparison of initial baseline visibility conditions to

natural visibility conditions indicates the amount of improvement necessary to attain natural visibility, while the future comparison of baseline conditions to the then current conditions will indicate the amount of progress made. In general, the 2000-2004 baseline period is considered the time from which improvement in visibility is measured.

### **C. Determination of Reasonable Progress Goals (RPGs)**

The vehicle for ensuring continuing progress towards achieving the natural visibility goal is the submission of a series of regional haze SIPs from the States that establish RPGs for Class I areas for each (approximately) 10-year planning period. The RHR does not mandate specific milestones or rates of progress, but instead calls for States to establish goals that provide for “reasonable progress” toward achieving natural (i.e., “background”) visibility conditions for their Class I areas. In setting RPGs, States must provide for an improvement in visibility for the most impaired days over the (approximately) 10-year period of the SIP, and ensure no degradation in visibility for the least impaired days over the same period.

States have significant discretion in establishing RPGs, but are required to consider the following factors established in the CAA and in EPA’s RHR: (1) the costs of compliance; (2) the time necessary for compliance; (3) the energy and non-air quality environmental impacts of compliance; and (4) the remaining useful life of any potentially affected sources. States must demonstrate in their SIPs how these factors are considered when selecting the RPGs for the best and worst days for each applicable Class I area. See 40 CFR 51.308(d)(1)(i)(A). States have considerable flexibility in how they take these factors into consideration, as noted in EPA’s July 1, 2007 memorandum from William L. Wehrum, Acting Administrator for Air and Radiation, to

EPA Regional Administrators, EPA Regions 1-10, entitled *Guidance for Setting Reasonable Progress Goals under the Regional Haze Program* (p. 4-2, 5-1)(EPA’s Reasonable Progress Guidance). In setting the RPGs, States must also consider the rate of progress needed to reach natural visibility conditions by 2064 (referred to as the “uniform rate of progress” or the “glide path”) and the emission reduction measures needed to achieve that rate of progress over the 10-year period of the SIP. The year 2064 represents a rate of progress which States are to use for analytical comparison to the amount of progress they expect to achieve. In setting RPGs, each State with one or more Class I areas (“Class I State”) must also consult with potentially “contributing States,” i.e., other nearby States with emission sources that may be contributing to visibility impairment at the Class I State’s areas. See 40 CFR 51.308(d)(1)(iv).

#### **D. Best Available Retrofit Technology (BART)**

Section 169A of the CAA directs States to evaluate the use of retrofit controls at certain larger, often uncontrolled, older stationary sources in order to address visibility impacts from these sources. Specifically, the CAA requires States to revise their SIPs to contain such measures as may be necessary to make reasonable progress towards the natural visibility goal, including a requirement that certain categories of existing stationary sources built between 1962 and 1977 procure, install, and operate the “Best Available Retrofit Technology” as determined by the State. (CAA 169A(b)(2)a)).<sup>3</sup> States are directed to conduct BART determinations for such sources that may be anticipated to cause or contribute to any visibility impairment in a Class I area. Rather than requiring source-specific BART controls, States also have the flexibility to

---

<sup>3</sup> The set of “major stationary sources” potentially subject to BART are listed in CAA section 169A(g)(7).

adopt an emissions trading program or other alternative program as long as the alternative provides greater reasonable progress towards improving visibility than BART.

On July 6, 2005, EPA published the *Guidelines for BART Determinations Under the Regional Haze Rule* at Appendix Y to 40 CFR part 51 (hereinafter referred to as the “BART Guidelines”) to assist States in determining which of their sources should be subject to the BART requirements and in determining appropriate emission limits for each applicable source. In making a BART applicability determination for a fossil fuel-fired electric generating plant with a total generating capacity in excess of 750 megawatts (MW), a State must use the approach set forth in the BART Guidelines. A State is encouraged, but not required, to follow the BART Guidelines in making BART determinations for other types of sources.

States must address all visibility impairing pollutants emitted by a source in the BART determination process. The most significant visibility impairing pollutants are sulfur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), and particulate matter (PM). EPA has stated that States should use their best judgment in determining whether volatile organic compounds (VOCs), or ammonia (NH<sub>3</sub>) and ammonia compounds impair visibility in Class I areas.

The RPOs provided air quality modeling to the States to help them in determining whether potential BART sources can be reasonably expected to cause or contribute to visibility impairment in a Class I area. Under the BART Guidelines, States may select an exemption threshold value for their BART modeling, below which a BART eligible source would not be expected to cause or contribute to visibility impairment in any Class I area. The State must

document this exemption threshold value in the SIP and must state the basis for its selection of that value. Any source with emissions that model above the threshold value would be subject to a BART determination review. The BART Guidelines acknowledge varying circumstances affecting different Class I areas. States should consider the number of emission sources affecting the Class I areas at issue and the magnitude of the individual sources' impacts. Any exemption threshold set by the State should not be higher than 0.5 deciviews. See 70 FR 39161, (July 6, 2005).

In their SIPs, States must identify potential BART sources, described as “BART-eligible sources” in the RHR, and document their BART control determination analyses. The term “BART-eligible source” used in the BART Guidelines means the collection of individual emission units at a facility that together comprises the BART-eligible source. See 70 FR 39161, (July 6, 2005). In making BART determinations, section 169A(g)(2) of the CAA requires that States consider the following factors: (1) the costs of compliance; (2) the energy and non-air quality environmental impacts of compliance; (3) any existing pollution control technology in use at the source; (4) the remaining useful life of the source; and (5) the degree of improvement in visibility which may reasonably be anticipated to result from the use of such technology. States are free to determine the weight and significance to be assigned to each factor. See 70 FR 39170, (July 6, 2005).

A regional haze SIP must include source-specific BART emission limits and compliance schedules for each source subject to BART. Once a State has made its BART determination, the BART controls must be installed and in operation as expeditiously as practicable, but no later

than five years after the date of EPA approval of the regional haze SIP, as required by CAA (section 169(g)(4)) and the RHR (40 CFR 51.308(e)(1)(iv)). In addition to what is required by the RHR, general SIP requirements mandate that the SIP must also include all regulatory requirements related to monitoring, recordkeeping, and reporting for the BART controls on the source. States have the flexibility to choose the type of control measures they will use to meet the requirements of BART.

#### **E. Long-Term Strategy (LTS)**

Forty CFR 51.308(d)(3) of the RHR requires that States include a LTS in their SIPs. The LTS is the compilation of all control measures a State will use to meet any applicable RPGs. The LTS must include “enforceable emissions limitations, compliance schedules, and other measures as necessary to achieve the reasonable progress goals” for all Class I areas within, or affected by emissions from, the State. See 40 CFR 51.308(d)(3).

When a State’s emissions are reasonably anticipated to cause or contribute to visibility impairment in a Class I area located in another State, the RHR requires the impacted State to coordinate with the contributing States in order to develop coordinated emissions management strategies. See 40 CFR 51.308(d)(3)(i). In such cases, the contributing State must demonstrate that it has included in its SIP all measures necessary to obtain its share of the emission reductions needed to meet the RPGs for the Class I area. The RPOs have provided forums for significant interstate consultation, but additional consultations between States may be required to sufficiently address interstate visibility issues. This is especially true where two States belong to different RPOs.



States should consider all types of anthropogenic sources of visibility impairment in developing their LTS, including stationary, minor, mobile, and area sources. At a minimum, States must describe how each of the seven factors listed below is taken into account in developing their LTS: (1) emission reductions due to ongoing air pollution control programs, including measures to address RAVI; (2) measures to mitigate the impacts of construction activities; (3) emissions limitations and schedules for compliance to achieve the RPG; (4) source retirement and replacement schedules; (5) smoke management techniques for agricultural and forestry management purposes including plans as currently exist within the State for these purposes; (6) enforceability of emissions limitations and control measures; (7) the anticipated net effect on visibility due to projected changes in point, area, and mobile source emissions over the period addressed by the LTS. See 40 CFR 51.308(d)(3)(v).

#### **F. Coordinating Regional Haze and Reasonably Attributable Visibility Impairment (RAVI) LTS**

As part of the RHR, EPA revised 40 CFR 51.306(c) regarding the LTS for RAVI to require that the RAVI plan must provide for a periodic review and SIP revision not less frequently than every three years until the date of submission of the State's first plan addressing regional haze visibility impairment, which was due December 17, 2007, in accordance with 40 CFR 51.308(b) and (c). On or before this date, the State must revise its plan to provide for review and revision of a coordinated LTS for addressing reasonably attributable and regional haze visibility impairment, and the State must submit the first such coordinated LTS with its first regional haze SIP. Future coordinated LTS's, and periodic progress reports evaluating progress towards RPGs,

must be submitted consistent with the schedule for SIP submission and periodic progress reports set forth in 40 CFR 51.308(f) and 51.308(g), respectively. The periodic reviews of a State's LTS must report on both regional haze and RAVI impairment and must be submitted to EPA as a SIP revision.

### **G. Monitoring Strategy and Other Implementation Plan Requirements**

Forty CFR 51.308(d)(4) of the RHR includes the requirement for a monitoring strategy for measuring, characterizing, and reporting of regional haze visibility impairment that is representative of all mandatory Class I Federal areas within the State. The strategy must be coordinated with the monitoring strategy required in section 40 CFR 51.305 for RAVI.

Compliance with this requirement may be met through participation in the IMPROVE network.

The monitoring strategy is due with the first regional haze SIP, and it must be reviewed every five years. The monitoring strategy must also provide for additional monitoring sites if the IMPROVE network is not sufficient to determine whether RPGs will be met.

The SIP must also provide for the following:

- Procedures for using monitoring data and other information in a State with mandatory Class I areas to determine the contribution of emissions from within the State to regional haze visibility impairment at Class I areas both within and outside the State;
- Procedures for using monitoring data and other information in a State with no mandatory Class I areas to determine the contribution of emissions from within the State to regional haze visibility impairment at Class I areas in other States;

- Reporting of all visibility monitoring data to the Administrator at least annually for each Class I area in the State, and where possible, in electronic format;
- Developing a statewide inventory of emissions of pollutants that are reasonably anticipated to cause or contribute to visibility impairment in any Class I area. The inventory must include emissions for a baseline year, emissions for the most recent year for which data are available, and estimates of future projected emissions. A State must also make a commitment to update the inventory periodically; and
- Other elements, including reporting, recordkeeping, and other measures necessary to assess and report on visibility.

Forty CFR 51.308(f) of the RHR requires control strategies to cover an initial implementation period extending to the year 2018, with a comprehensive reassessment and revision of those strategies, as appropriate, every 10 years thereafter. Periodic SIP revisions must meet the core requirements of 40 CFR 51.308(d) with the exception of BART. The BART provisions of 40 CFR 51.308(e), as noted above, apply only to the first implementation period. Periodic SIP revisions will assure that the statutory requirement of reasonable progress will continue to be met.

#### **H. Consultation with States and Federal Land Managers (FLMs)**

The RHR requires that States consult with FLMs before adopting and submitting their SIPs. See 40 CFR 51.308(i). States must provide FLMs an opportunity for consultation, in person and at least 60 days prior to holding any public hearing on the SIP. This consultation must include the opportunity for the FLMs to discuss their assessment of

impairment of visibility in any Class I area and to offer recommendations on the development of the RPGs and on the development and implementation of strategies to address visibility impairment. Further, a State must include in its SIP a description of how it addressed any comments provided by the FLMs. Finally, a SIP must provide procedures for continuing consultation between the State and FLMs regarding the State's visibility protection program, including development and review of SIP revisions, five-year progress reports, and the implementation of other programs having the potential to contribute to impairment of visibility in Class I areas.

### **III. What is EPA's Analysis of Vermont's Regional Haze SIP Submittal?**

On August 26, 2009, VT DEC's Office of Air resources submitted revisions to the Vermont SIP to address regional haze as required by EPA's RHR, specifically 40 CFR 51.308. Supplemental documentation was submitted on January 3, 2012. EPA has reviewed Vermont's submittal and is proposing to find that it is consistent with the requirements of 40 CFR 51.308 as outlined in Section II. A detailed analysis follows.

Vermont is responsible for developing a regional haze SIP which addresses visibility in Vermont's Class I area, Lye Brook Wilderness Area. The state must also address Vermont's impact on any other nearby Class I areas.

#### **A. Vermont's Affected Class I Area**

Vermont is home to one Class I area, Lye Brook Wilderness Area ("Lye Brook"). In addition to Lye Brook, the MANE-VU RPO contains six other Class I areas in three states: Moosehorn

Wilderness Area, Acadia National Park, and Roosevelt/Campobello International Park in Maine; Presidential Range/Dry River Wilderness Area and Great Gulf Wilderness Area in New Hampshire; and Brigantine Wilderness Area in New Jersey.

The Vermont regional haze SIP establishes RPGs for visibility improvement at its Class I area and a LTS to achieve those RPGs within the first regional haze implementation period ending in 2018. In developing the RPGs for Lye Brook, Vermont considered both emission sources inside and outside of Vermont that may cause or contribute to visibility impairment in Vermont's Class I area. The State also identified and considered emission sources within Vermont that may cause or contribute to visibility impairment in Class I areas in neighboring States as required by 40 CFR 51.308(d)(3). The MANE-VU RPO worked with the State in developing the technical analyses used to make these determinations, including state-by-state contributions to visibility impairment in specific Class I areas, which included Lye Brook and those areas which may be affected by emissions from Vermont. This analysis is discussed in Section III.C.

## **B. Determination of Baseline, Natural and Current Visibility Conditions**

As required by the RHR and in accordance with EPA's 2003 Natural Visibility Guidance, Vermont calculated baseline/current and natural conditions for its Class I area.

### **1. Estimating Natural Visibility Conditions**

Natural background refers to visibility conditions that existed before human activities affected air quality in the region. The national goal, as set out in the Clean Air Act, is a return to natural visibility conditions.

Estimates of natural visibility conditions are based on annual average concentrations of fine particle components. The IMPROVE<sup>4</sup> equation is a formula for estimating light extinction from species measured by the IMPROVE monitors. As documented in EPA's 2003 Natural Visibility Guidance, EPA determined, with concurrence from the IMPROVE Steering Committee, that States may use a "refined approach" to the then current IMPROVE formula to estimate the values that characterize the natural visibility conditions of the Class I areas. The purpose of the refinement to the "old IMPROVE equation" is to provide more accurate estimates of the various factors that affect the calculation of light extinction. The new IMPROVE equation takes into account the most recent review of the science<sup>5</sup> and accounts for the effect of particle size distribution on light extinction efficiency of sulfate, nitrate, and organic carbon. It also adjusts the mass multiplier for organic carbon (particulate organic matter) by increasing it from 1.4 to 1.8. New terms are added to the equation to account for light extinction by sea salt and light absorption by gaseous nitrogen dioxide. Site-specific values are used for Rayleigh scattering (scattering of light due to atmospheric gases) to account for the site-specific effects of elevation

---

<sup>4</sup> The Interagency Monitoring of Protected Visual Environments (IMPROVE) program is a cooperative measurement effort governed by a steering committee composed of representatives from Federal (including representatives from EPA and the FLMs) and RPOs. The IMPROVE monitoring program was established in 1985 to aid the creation of Federal and State implementation plans for the protection of visibility in Class I areas. One of the objectives of IMPROVE is to identify chemical species and emission sources responsible for existing man-made visibility impairment. The IMPROVE program has also been a key participant in visibility-related research, including the advancement of monitoring instrumentation, analysis techniques, visibility modeling, policy formulation and source attribution field studies.

<sup>5</sup> The science behind the revised IMPROVE equation is summarized in numerous published papers. See, eg., J. L. Hand & W. C. Malm, *Review of the IMPROVE Equation for Estimating Ambient Light Extinction Coefficients - Final Report*, March 2006 (Interagency Monitoring of Protected Visual Environments (IMPROVE), Colorado State University, Cooperative Institute for Research in the Atmosphere, Fort Collins, CO), available at [http://vista.cira.colostate.edu/improve/publications/GrayLit/016\\_IMPROVEeqReview/IMPROVEeqReview.htm](http://vista.cira.colostate.edu/improve/publications/GrayLit/016_IMPROVEeqReview/IMPROVEeqReview.htm); Marc Pitchford, *Natural Haze Levels II: Application of the New IMPROVE Algorithm to Natural Species Concentrations Estimates: Final Report of the Natural Haze Levels II Committee to the RPO Monitoring/Data Analysis Workgroup*, Sept. 2006, available at [http://vista.cira.colostate.edu/improve/Publications/GrayLit/029\\_NaturalCondII/naturalhazelevelsIIreport.ppt](http://vista.cira.colostate.edu/improve/Publications/GrayLit/029_NaturalCondII/naturalhazelevelsIIreport.ppt).

and temperature. Separate relative humidity enhancement factors are used for small and large size distributions of ammonium sulfate and ammonium nitrate and for sea salt. The terms for the remaining contributors, elemental carbon (light-absorbing carbon), fine soil, and coarse mass terms, do not change between the original and new IMPROVE equations. Vermont opted to use this refined approach, referred to as the “new IMPROVE equation,” for its Class I area.

Natural visibility conditions using the new IMPROVE equation were calculated separately for each Class I area by MANE-VU. EPA finds that the best and worst 20 percent natural visibility values for Lye Brook, as shown in Table 1, were calculated using the EPA guidelines.

## **2. Estimating Baseline Conditions**

Lye Brook does not contain an IMPROVE monitor. In cases where onsite monitoring is not available, 40 CFR 51.308(d)(2)(i) requires States to use the most representative monitoring available for the 2000-2004 period to establish baseline visibility conditions, in consultation with EPA. Vermont used, and EPA concurs with the use of, 2000-2004 data from the IMPROVE monitor at Mount Equinox for Lye Brook. The Mount Equinox IMPROVE monitor is located on a mountain ridge across the valley to the west of Lye Brook. Lye Brook is at high elevation in the Green Mountains and the IMPROVE site across the valley is at about the same height as Lye Brook.

As explained in Section II.B, for the first regional haze SIP, baseline visibility conditions are the same as current conditions. A five-year average of the 2000 to 2004 monitoring data was calculated for each of the 20 percent worst and 20 percent best visibility days for Lye Brook.

IMPROVE data records for the period 2000 to 2004 meet the EPA requirements for data completeness. See EPA's 2003 Tracking Progress Guidance, p. 2-8.

### **3. Summary of Baseline and Natural Conditions**

For the Vermont Class I area, baseline visibility conditions on the 20 percent worst days is 24.4 deciviews. Natural visibility for this area is predicted to be 11.7 on the 20 percent worst visibility days. The natural and background conditions for Lye Brook for both the 20 percent worst and 20 percent best days are presented in Table 1 below.

**Table 1 - Natural Background and Baseline Conditions for the Lye Brook Wilderness Area**

	Average for 20 percent worst days (dv)	Average for the 20 percent best days (dv)
Natural Background Conditions	11.7	2.8
Baseline Visibility Conditions	24.4	6.4

### **4. Uniform Rate of Progress**

In setting the RPGs, Vermont considered the uniform rate of progress needed to reach natural visibility conditions by 2064 ("glide path") and the emission reduction measures needed to achieve that rate of progress over the period of the SIP to meet the requirements of 40 CFR 51.308(d)(1)(i)(B). As explained in EPA's Reasonable Progress Guidance document, the uniform rate of progress is not a presumptive target, and RPGs may be greater, lesser, or equivalent to the glide path.



For Lye Brook, the overall visibility improvement necessary to reach natural conditions is the difference between the baseline visibility of 24.4 dv and natural background visibility of 11.7 dv, or an improvement of 12.7 dv for the 20 percent worst visibility days. VT DEC must also ensure no degradation in visibility for the best 20 percent visibility days over the same period in accordance with 40 CFR 51.308(d)(1).

Vermont's SIP submittal presents two graphs, one for the 20 percent best days, and one for the 20 percent worst days, for its Class I area. Vermont constructed the graphs for the worst days (i.e., the glide path) in accordance with EPA's 2003 Tracking Progress Guidance by plotting a straight graphical line from the baseline level of visibility impairment for 2000-2004 to the level of natural visibility conditions in 2064. For the best days, the graphs include a horizontal, straight line spanning from baseline conditions in 2004 out to 2018 to depict no degradation in visibility over the implementation period of the SIP. Vermont's SIP shows that the State's RPG for its Class I areas provide for improvement in visibility for the 20 percent worst days over the period of the implementation plan and ensure no degradation in visibility for the 20 percent best visibility days over the same period in accordance with 40 CFR 51.308(d)(1).

### **C. Reasonable Progress Goals**

As a state containing a Class I area, 40 CFR 51.308(d)(1) of the RHR requires Vermont to develop the reasonable progress goals for visibility improvement during the first planning period.

#### **1. Relative Contributions of Pollutants to Visibility Impairment**

An important step toward identifying reasonable progress measures is to identify the key pollutants contributing to visibility impairment at each Class I area. To understand the relative benefit of further reducing emissions from different pollutants, MANE-VU developed emission sensitivity model runs using EPA's Community Multiscale Air Quality (CMAQ) air quality model<sup>6</sup> to evaluate visibility and air quality impacts from various groups of emissions and pollutant scenarios in the Class I areas on the 20 percent worst visibility days.

Regarding which pollutants are most significantly impacting visibility in the MANE-VU region, MANE-VU's contribution assessment demonstrated that sulfate is the major contributor to PM<sub>2.5</sub> mass and visibility impairment at Class I areas in the Northeast and Mid-Atlantic Region.<sup>7</sup> Sulfate particles commonly account for more than 50 percent of particle-related light extinction at northeastern Class I areas on the clearest days and for as much as, or more than, 80 percent on the haziest days. For example, at the Brigantine National Wildlife Refuge Class I area (the MANE-VU Class I area with the greatest visibility impairment), on the 20 percent worst visibility days in 2000 through 2004, sulfate accounted for 66 percent of the particle extinction. After sulfate, organic carbon (OC) consistently accounts for the next largest fraction of light extinction. Organic carbon accounted for 13 percent of light extinction on the 20 percent worst visibility days for Brigantine, followed by nitrate that accounts for 9 percent of light extinction.

---

<sup>6</sup> CMAQ is a photochemical grid model. The model uses simulations of chemical reactions, emissions of PM<sub>2.5</sub> and PM<sub>2.5</sub> precursors, and the Pennsylvania State University/ National Center for Atmospheric Research Mesoscale Meteorological Model to produce speciated PM<sub>2.5</sub> concentrations. For more information, see [www.epa.gov/asmdnerl/CMAQ/cmaq\\_model.html](http://www.epa.gov/asmdnerl/CMAQ/cmaq_model.html)

<sup>7</sup> See the NESCAUM Document "Regional Haze and Visibility in the Northeast and Mid-Atlantic States," January 31, 2001.

The emissions sensitivity analyses conducted by MANE-VU predict that reductions in SO<sub>2</sub> emissions from EGU and non-EGU industrial point sources will result in the greatest improvements in visibility in the Class I areas in the MANE-VU region, more than any other visibility-impairing pollutant. As a result of the dominant role of sulfate in the formation of regional haze in the Northeast and Mid-Atlantic Region, MANE-VU concluded that an effective emissions management approach would rely heavily on broad-based regional SO<sub>2</sub> control efforts in the eastern United States.

Through source apportionment modeling, MANE-VU assisted States in determining their contribution to the visibility impairment of each Class I area in the MANE-VU region. Vermont and the other MANE-VU States adopted a weight-of-evidence approach which relied on several independent methods for assessing the contribution of different sources and geographic source regions to regional haze in the northeastern and mid-Atlantic portions of the United States. Details about each technique can be found in the NESCAUM Document *Contributions to Regional Haze in the Northeast and Mid-Atlantic United States*, August 2006 (hereinafter referred to as the “Contribution Report”).<sup>8</sup>

The MANE-VU Class I States determined that any state contributing at least 2% of the total sulfate observed on the 20 percent worst visibility days in 2002 were contributors to visibility impairment at the Class I area. States found to contribute 2% or more of the sulfate at any of the MANE-VU Class I areas were: Georgia, Illinois, Indiana, Kentucky, Maine, Maryland,

---

<sup>8</sup> The August 2006 NESCAUM document “Contributions to Regional Haze in the Northeast and Mid-Atlantic United States” has been provided as part of the docket to this proposed rulemaking.

Massachusetts, Michigan, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia, and Wisconsin.<sup>9</sup>

The contribution of Vermont emissions to the total sulfate observed on the 20% worst visibility days in 2002 was determined to be less than 2%, therefore, not impacting the visibility in the Vermont Class I area, nor any other Class I area.

EPA proposes to find that VT DEC has adequately demonstrated that emissions from Vermont sources do not cause or contribute to visibility impairment in any Class I Area.

## **2. Procedure for Identifying Sources to Evaluate for Reasonable Progress Controls**

In developing the 2018 reasonable progress goal, Vermont relied primarily upon the information and analysis developed by MANE-VU to meet this requirement. Based on the Contribution Report, MANE-VU focused on SO<sub>2</sub> as the dominant contributor to visibility impairment at all MANE-VU Class I areas during all seasons. In addition, the Contribution Report found that only 25 percent of the sulfate at the MANE-VU Class I areas originate in the MANE-VU States. Sources in the Midwest and Southeast regions were responsible for 15 to 25 percent, respectively. Point sources dominated the inventory of SO<sub>2</sub> emissions. Therefore, MANE-VU's strategy includes additional measures to control sources of SO<sub>2</sub> both within the MANE-VU region and in other States that were determined to contribute to regional haze at the MANE-VU Class I Areas.

---

<sup>9</sup> MANE-VU modeling did not indicate Wisconsin's contribution was above this threshold. VT DEC undertook independent modeling that showed Wisconsin's contribution to Vermont's visibility impairment was above this threshold. Therefore, Vermont requested Wisconsin join the interstate consultation process.

Based on information from the Contribution Report and additional emission inventory analysis, MANE-VU and Vermont identified the following source categories for further examination for reasonable controls:

- Coal and oil-fired EGUs;
- Point and area source industrial, commercial and institutional boilers;
- Cement and Lime Kilns;
- Heating Oil; and
- Residential wood combustion.

MANE-VU analyzed these sources categories as potential sources of emission reductions for making reasonable progress based on the “four statutory factors” according to 40 CFR 51.308(d)(3)(V).

### **3. Application of the Four Clean Air Act Factors in the Reasonable Progress Analysis**

As discussed in Section II.C above, Vermont must consider the following factors in developing the RPGs: (1) cost of compliance; (2) the time necessary for compliance; (3) the energy and non-air quality environmental impacts of compliance; and (4) the remaining useful life of any potentially affected sources. MANE-VU’s four factor analysis can be found in *Assessment of Reasonable Progress for Regional Haze in MANE-VU Class I Areas*, July 9, 2007, otherwise known as the Reasonable Progress Report.<sup>10</sup>

---

<sup>10</sup> This report has been included as part of the docket for this rulemaking.

Vermont and the other MANE-VU States reviewed the Reasonable Progress Report, consulted with one another about possible controls measures, and agreed to the following measures as recommended strategies for making reasonable progress: implementation of the BART requirements; a 90 percent reduction in SO<sub>2</sub> emissions from 167 EGUs identified as causing the greatest visibility impact<sup>11</sup> (or other equivalent emission reduction); and a reduction in the sulfur content of fuel oil. These measures are collectively known as the MANE-VU “Ask.”

MANE-VU used model projections to calculate the RPG for the Class I areas in the MANE-VU region. Additional modeling details are provided in Section III.E.2. The projected improvement in visibility due to emission reductions expected by the end of the first period, 2018, is shown in Table 2.

---

<sup>11</sup> MANE-VU identified these 167 units based on source apportionment modeling using two different meteorological data sets. From each of the modeling runs, MANE-VU identified the top 100 units which contribute to visibility impairment. Differences in model output resulted in a total of 167 units being identified for further control.

**Table 2 – Projected Reasonable Progress Goal and Uniform Rate of Progress (URP) for the Vermont Class I Area from NESCAUM 2018 Visibility Projections in Deciviews**

		2000 – 2004 Baseline	2018 Projection	URP	Natural Background
Lye Brook Wilderness Area	20% Worst Visibility Days	24.4	20.9	21.43	11.7
	20% Best Visibility Days	6.4	5.5	-	2.8

At the time of MANE-VU modeling, some of the other States with sources potentially impacting visibility in the Class I areas of the MANE-VU region, including Lye Brook Wilderness Area in Vermont, had not yet made final control determinations for BART, and thus, these controls were not included in the modeling prepared by MANE-VU and used by Vermont. This is a conservative approach because additional emission reductions could result from the application of BART controls. The modeling conducted by MANE-VU demonstrates that the 2018 control scenario (2018 projection) provides for an improvement in visibility greater than the uniform rate of progress for the Vermont Class I area for the most impaired days over the period of the implementation plan and ensures no degradation in visibility for the least impaired days over the same period.

Consistent with EPA guidance at the time, the MANE-VU modeling included reductions from the Clean Air Interstate Rule (CAIR) in estimating the RPGs for 2018. The regional haze provisions specify that a state may not adopt a RPG that represents less visibility improvement than is expected to result from other CAA requirements during the implementation period. See 40 CFR 51.308(d)(1)(vi). Therefore, in estimating the RPGs for 2018, many States took into account emission reductions anticipated from CAIR. MANE-VU initially reduced emissions

from highest impacting 167 EGUs by ninety percent. However, many of the units targeted for the 90% reduction were part of the CAIR program. Since the 90% reduction was larger, in total tons of emissions reduced, than the reductions expected from CAIR, MANE-VU added the excess emissions back into the inventory to account for trading of the emission credits across the modeling domain. This way, MANE-VU States would not overestimate the emission reductions or the related visibility improvement if States used the CAIR program as their response to the MANE-VU's "Ask" of ninety percent reduction from the 167 EGUs in the eastern United States.

The RPGs for the Lye Brook Class I area in Vermont are based on modeled projections of future emissions that were developed using the best available information at the time the analysis was completed. While MANE-VU's emission inventory used for modeling included estimates of future emission growth, projections can change as additional information regarding future conditions becomes available. It would be both impractical and resource-intensive to require a state to continually adjust the RPG every time an event affecting these future projections changed. EPA recognized the problems of a rigid requirement to meet a long-term goal based on modeled projections of future visibility conditions, and addressed the uncertainties associated with RPGs in several ways. EPA made clear in the RHR that the RPG is not a mandatory standard which must be achieved by a particular date. See 64 FR 35733. At the same time, EPA established a requirement for a five-year, midcourse review and, if necessary, correction of the States' regional haze plans. See 40 CFR 52.308(g). In particular, the RHR calls for a five-year progress review after submittal of the initial regional haze plan. The purpose of this progress review is to assess the effectiveness of emission management strategies in meeting the RPG and to provide an assessment of whether current implementation strategies are sufficient for the state or affected states to meet their RPGs. If a state concludes, based on its assessment, that the



RPGs for a Class I area will not be met, the RHR requires the state to take appropriate action. See 40 CFR 52.308(h). The nature of the appropriate action will depend on the basis for the state's conclusion that the current strategies are insufficient to meet the RPGs. In its SIP submittal, Vermont commits to the midcourse review and submitting revisions to the regional haze plan where necessary.

The RPGs that Vermont has adopted are predicated on other contributing states achieving the EGU emission reductions anticipated under CAIR. However, Vermont's regional haze plan does not rely on CAIR for Vermont's appropriate contribution toward meeting the RPGs for the Class I area in Vermont or any other state. Vermont has demonstrated that the emission controls in the MANE-VU "Ask" - timely installation of BART Controls, a 90 percent reduction in SO<sub>2</sub> emissions from EGUs and a low sulfur fuel oil strategy - are reasonable measures for the reduction of visibility impairment as required by EPA's RHR. Therefore, EPA is proposing to approve Vermont's RPG for the first regional haze planning period irrespective of the status of CAIR and irrespective of the associated issues regarding the adequacy of other state's plans. For similar reasons, EPA believes the approvability of the Vermont plan is not affected by the status of the Cross State Air Pollution Rule, which was promulgated on August 8, 2011 at 76 FR 48208 and stayed on December 30, 2011.

#### **D. BART**

As part of developing its SIP, Vermont evaluated the major point sources in the State and determined that none meet the criteria (as described in Section II.D) to be considered BART-

eligible<sup>12</sup>. EPA agrees with VT DEC's determination and proposes to find that there are no sources in Vermont which meet the BART eligibility criteria.

### **E. Long-Term Strategy**

As described in Section II.E of this action, the LTS is a compilation of State-specific control measures relied on by the State to obtain its share of emission reductions to support the RPGs established by Vermont, New Hampshire, Maine, and New Jersey, the nearby Class I area States. Vermont's LTS for the first implementation period addresses the emissions reductions from federal, State, and local controls that take effect in the State from the baseline period starting in 2002 until 2018. Vermont participated in the MANE-VU regional strategy development process and supported a regional approach towards deciding which control measures to pursue for regional haze, which was based on technical analyses documented in the following reports: a) the Contribution Report; b) the Reasonable Progress Report; c) *Five-Factor Analysis of BART-Eligible Sources: Survey of Options for Conducting BART Determinations* (available at [www.nescaum.org/documents/bart-final-memo-06-28-07.pdf](http://www.nescaum.org/documents/bart-final-memo-06-28-07.pdf)); and d) *Assessment of Control Technology Options for BART-Eligible Sources: Steam Electric Boilers, Industrial Boilers, Cement Plants and Paper, and Pulp Facilities* (available at [www.nescaum.org/documents/bart-control-assessment.pdf](http://www.nescaum.org/documents/bart-control-assessment.pdf)).

The LTS was developed by Vermont, in coordination with MANE-VU, identifying the emissions units within Vermont that are currently likely to have the largest impacts on visibility at nearby Class I areas, estimating emissions reductions for 2018, based on all controls required

---

<sup>12</sup> A list of the BART-eligible sources in the MANE-VU area can be found in Appendix A of Attachment T - MANE-VU Five Factor Analysis of BART Eligible Sources of the Vermont SIP submittal.

under federal and state regulations for the 2002-2018 period, and comparing projected visibility improvement with the uniform rate of progress for the nearby Class I area.

Vermont's LTS includes measures needed to achieve its share of emissions reductions agreed upon through the consultation process with MANE-VU Class I States and includes enforceable emissions limitations, compliance schedules, and other measures necessary to achieve the reasonable progress goals established by New Hampshire, Maine and New Jersey for their Class I areas.

### **1. Emissions Inventory for 2018 with Federal and State Control Requirements**

The State-wide emissions inventories used in the regional haze technical analyses were developed by MARAMA for MANE-VU with assistance from Vermont. The 2018 emissions inventory was developed by projecting 2002 emissions forward based on assumptions regarding emissions growth due to projected increases in economic activity and emission reductions expected from federal and State regulations. MANE-VU's emissions inventories included estimates of NO<sub>x</sub>, coarse particulate matter (PM<sub>10</sub>), PM<sub>2.5</sub>, and SO<sub>2</sub>, VOC, and NH<sub>3</sub>. The BART guidelines direct States to exercise judgment in deciding whether VOC and NH<sub>3</sub> impair visibility in their Class I area(s). As discussed further in Section III.C.1 above, MANE-VU demonstrated that anthropogenic emissions of sulfates are the major contributor to PM<sub>2.5</sub> mass and visibility impairment at Class I areas in the Northeast and Mid-Atlantic region. It was also determined that the total ammonia emissions in the MANE-VU region are extremely small.

MANE-VU developed emissions inventories for four inventory source classifications: 1) stationary point sources, 2) stationary area sources, 3) non-road mobile sources, and 4) on-road mobile sources. The New York Department of Environmental Conservation also developed an inventory of biogenic emissions for the entire MANE-VU region. Stationary point sources are those sources that emit greater than a specified tonnage per year, depending on the pollutant, with data provided at the facility level. Stationary area sources are those sources whose individual emissions are relatively small, but due to the large number of these sources, the collective emissions from the source category could be significant. Non-road mobile sources are equipment that can move but do not use the roadways. On-road mobile source emissions are automobiles, trucks, and motorcycles that use the roadway system. The emissions from these sources are estimated by vehicle type and road type. Biogenic sources are natural sources like trees, crops, grasses, and natural decay of plants. Stationary point sources emission data is tracked at the facility level. For all other source types, emissions are summed on the county level.

There are many federal and State control programs being implemented that MANE-VU and Vermont anticipate will reduce emissions between the baseline period and 2018. Emission reductions from these control programs in the MANE-VU region were projected to achieve substantial visibility improvement by 2018 at all of the MANE-VU Class I areas. To assess emissions reductions from ongoing air pollution control programs, BART, and reasonable progress goals, MANE-VU developed 2018 emissions projections called “Best and Final.” The emissions inventory provided by the VT DEC for the “Best and Final” 2018 projections is based on expected control requirements.

Vermont relied on emission reductions from the following ongoing and expected air pollution control programs as part of the state's long term strategy. Non-EGU point source controls in Vermont include: Industrial, Commercial, and Institutional (ICI) Boiler requirements; 2-year, 4-year, 7-year, and 10-year Maximum Achievable Control Technology (MACT) Standards; Combustion Turbine and Reciprocating Internal Combustion Engine (RICE) MACT; Industrial Boiler/Process Heater MACT; and a low sulfur fuel oil strategy which is further described in Section III.E.3.

On July 30, 2007, the U.S. Court of Appeals for the District of Columbia vacated and remanded the Industrial Boiler MACT Rule. *NRDC v. EPA*, 489F.3d 1250 (D.C. Cir. 2007). This MACT was vacated since it was directly affected by the vacatur and remand of the Commercial and Industrial Solid Waste Incinerator (CISWI) definition rule. EPA proposed a new Industrial Boiler MACT rule to address the vacatur on June 4, 2010, (75 FR 32006) and issued a final rule on March 21, 2011 (76 FR 15608). On May 18, 2011, EPA stayed the effective date of the Industrial Boiler MACT pending review by the D.C. Circuit or the completion of EPA's reconsideration of the rule. See 76 FR 28662.

On December 2, 2011, EPA issued a proposed reconsideration of the MACT standards for existing and new boilers at major (76 FR 80598) and area (76 FR 80532) source facilities, and for Commercial and Industrial Solid Waste Incinerators (76 FR 80452). On January 9, 2012, the U.S. District Court for the District of Columbia vacated EPA's stay of the effectiveness date of the Industrial Boiler MACT, reinstating the original effective date and therefore requiring

compliance with the current rule in 2014. *Sierra Club v. Jackson*, Civ. No. 11-1278, slip op. (D.D.C. Jan. 9, 2012).

Even though Vermont's modeling is based on the old Industrial Boiler MACT limits Vermont's modeling conclusions are unlikely to be affected because the expected reductions in SO<sub>2</sub> and PM resulting from the vacated MACT rule are a relatively small component of the Vermont inventory and the expected emission reductions from the final MACT rule are comparable to those modeled. In addition, the new MACT rule requires compliance by 2014 and therefore the expected emission reductions will be achieved prior to the end of the first implementation period in 2018. Thus, EPA does not expect that differences between the old and revised Industrial Boiler MACT emission limits would affect the adequacy of the existing Vermont regional haze SIP. If there is a need to address discrepancies between projected emissions reductions from the old Industrial Boiler MACT and the Industrial Boiler MACT finalized in March 2011, we expect Vermont to do so in their 5-year progress report.

Controls on area sources expected by 2018 include: solvent metal cleaning (APC regulation 5-253.14); coating of miscellaneous metal parts (APC regulation 5-253.13); and VOC control measures for portable fuel containers (contained in EPA's Mobile Source Air Toxics rule).

Controls on mobile sources expected by 2018 include: Stage I vapor recovery systems at vehicle refueling stations (APC regulation 5-253.5); Stage II vapor recovery at gasoline dispensing facility with an annual gasoline throughput of 400,000 gallons or more (APC

regulation 5-253.7)<sup>13</sup>; Federal On-Board Refueling Vapor Recovery (ORVR) Rule; Federal Tier 2 Motor Vehicle Emissions Standards and Gasoline Sulfur Requirements; Federal Heavy-Duty Diesel Engine Emission Standards for Trucks and Buses; and Federal Emission Standards for Large Industrial Spark-Ignition Engines and Recreation Vehicles.

Controls on non-road sources expected by 2018 include the following federal regulations: Control of Air Pollution: Determination of Significance for Nonroad Sources and Emission Standards for New Nonroad Compression Ignition Engines at or above 37 kilowatts (59 FR 31306, (June 17, 1994)); Control of Emissions of Air Pollution from Nonroad Diesel Engines (63 FR 56967, (Oct. 23, 1998)); Control of Emissions from Nonroad Large Spark-Ignition Engines and Recreational Engines (67 FR 68241, (Nov. 8, 2002)); and Control of Emissions of Air Pollution from Nonroad Diesel Engines and Fuels (69 FR 38958, (June 29, 2004)).

Tables 3 and 4 are summaries of the 2002 baseline and 2018 estimated emissions inventories for Vermont. The 2018 estimated emissions include emissions growth as well as emission reductions due to ongoing emission control strategies and reasonable progress goals.

**Table 3: 2002 Emissions Inventory Summary for Vermont (tons per year)**

---

<sup>13</sup> Vermont's recently enacted legislation, Title 10 V.S.A. §583, "Repeal of Stage II vapor recovery requirements," repeals the DEC's authority to require Stage II controls as of January 1, 2013, and exempts from control facilities constructed after May 1, 2009. In addition, Vermont's statute states that "each gasoline dispensing facility shall decommission its Stage II vapor recovery systems, including below-ground components, pursuant to methods approved by the secretary" within two years of the Stage II requirements no longer applying to the individual gasoline dispensing facility. It should be noted, however, that the CAA requires states in the Ozone Transport Region, such as Vermont, to adopt, and submit to EPA as a State Implementation Plan (SIP) revision, Stage II controls or measures that achieve comparable emission reductions. Previously, Vermont's strategy for addressing this requirement has been to implement a Stage II vapor recovery program. However, since Vermont statute now calls for the sunset of this program, the DEC will need to submit a SIP revision demonstrating that the state is achieving comparable volatile organic compound (VOC) emission reductions through the implementation of other control measures. Therefore, consideration of these reductions in the model is reasonable.

	VOC	NO <sub>x</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	NH <sub>3</sub>	SO <sub>2</sub>
<b>Point</b>	1,097	787	267	304	6,194	905
<b>Area</b>	23,265	3,028	11,065	56,131	9,848	4,087
<b>On-Road Mobile</b>	17,288	20,670	483	670	934	894
<b>Non-Road Mobile</b>	10,548	4,217	486	530	5	372
<b>Biogenics</b>	118,377	1,142	0	0	0	0
<b>Total</b>	<b>170,574</b>	<b>30,024</b>	<b>12,300</b>	<b>57,634</b>	<b>16,981</b>	<b>6,258</b>

**Table 4: 2018 Emissions Inventory Summary for Vermont (tons per year)**

	VOC	NO <sub>x</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	NH <sub>3</sub>	SO <sub>2</sub>
<b>Point</b>	1,711	572	271	322	9	407
<b>Area</b>	26,197	3,430	7,214	22,585	14,580	2,990
<b>On-Road Mobile</b>	4,072	4,744	144	145	936	82
<b>Non-Road Mobile</b>	7,566	2,262	303	331	6	13
<b>Biogenics</b>	118,377	1,142	0	0	0	0
<b>Total</b>	<b>157,922</b>	<b>12,149</b>	<b>7,932</b>	<b>23,383</b>	<b>15,531</b>	<b>3,493</b>

## **2. Modeling to Support the LTS and Determine Visibility Improvement for Uniform Rate of Progress**

MANE-VU performed modeling for the regional haze LTS for the 11 Mid-Atlantic and Northeast States and the District of Columbia. The modeling analysis is a complex technical



evaluation that began with selection of the modeling system. MANE-VU used the following modeling system:

- **Meteorological Model:** The Fifth-Generation Pennsylvania State University/National Center for Atmospheric Research (NCAR) Mesoscale Meteorological Model (MM5) version 3.6 is a nonhydrostatic, prognostic meteorological model routinely used for urban- and regional-scale photochemical, PM<sub>2.5</sub>, and regional haze regulatory modeling studies.
- **Emissions Model:** The Sparse Matrix Operator Kernel Emissions (SMOKE) version 2.1 modeling system is an emissions modeling system that generates hourly gridded speciated emission inputs of mobile, non-road mobile, area, point, fire, and biogenic emission sources for photochemical grid models.
- **Air Quality Model:** The EPA's Models-3/Community Multiscale Air Quality (CMAQ) version 4.5.1 is a photochemical grid model capable of addressing ozone, PM, visibility and acid deposition at a regional scale.
- **Air Quality Model:** The Regional Model for Aerosols and Deposition (REMSAD) is a Eulerian grid model that was primarily used to determine the attribution of sulfate species in the Eastern US via the species-tagging scheme.
- **Air Quality Model:** The California Puff Model (CALPUFF), version 5 is a non-steady-state Lagrangian puff model used to assess the contribution of individual States' emissions to sulfate levels at selected Class I receptor sites.

CMAQ modeling of regional haze in the MANE-VU region for 2002 and 2018 was carried out on a grid of 12x12 kilometer (km) cells that covers the 11 MANE-VU States (Connecticut,

Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont) and the District of Columbia and States adjacent to them. This grid is nested within a larger national CMAQ modeling grid of 36x36 km grid cells that covers the continental United States, portions of Canada and Mexico, and portions of the Atlantic and Pacific Oceans along the east and west coasts. Selection of a representative period of meteorology is crucial for evaluating baseline air quality conditions and projecting future changes in air quality due to changes in emissions of visibility-impairing pollutants. MANE-VU conducted an in-depth analysis which resulted in the selection of the entire year of 2002 (January 1-December 31) as the best period of meteorology available for conducting the CMAQ modeling. The MANE-VU States' modeling was developed consistent with EPA's *Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, PM<sub>2.5</sub>, and Regional Haze*, April 2007 (EPA-454/B-07-002, available at [www.epa.gov/scram001/guidance/guide/final-03-pm-rh-guidance.pdf](http://www.epa.gov/scram001/guidance/guide/final-03-pm-rh-guidance.pdf)), and EPA document, *Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations*, August 2005 and updated November 2005 (EPA-454/R-05-001, available at [www.epa.gov/ttnchie1/eidocs/eiguid/index.html](http://www.epa.gov/ttnchie1/eidocs/eiguid/index.html)) (hereinafter referred to as "EPA's Modeling Guidance").

MANE-VU examined the model performance of the regional modeling for the areas of interest before determining whether the CMAQ model results were suitable for use in the regional haze assessment of the LTS and for use in the modeling assessment. The modeling assessment predicts future levels of emissions and visibility impairment used to support the LTS and to

compare predicted, modeled visibility levels with those on the uniform rate of progress. In keeping with the objective of the CMAQ modeling platform, the air quality model performance was evaluated using graphical and statistical assessments based on measured ozone, fine particles, and acid deposition from various monitoring networks and databases for the 2002 base year. MANE-VU used a diverse set of statistical parameters from the EPA's Modeling Guidance to stress and examine the model and modeling inputs. Once MANE-VU determined the model performance to be acceptable, MANE-VU used the model to assess the 2018 RPGs using the current and future year air quality modeling predictions, and compared the RPGs to the uniform rate of progress.

In accordance with 40 CFR 51.308(d)(3), VT DEC provided the appropriate supporting documentation for all required analyses used to determine the State's LTS. The technical analyses and modeling used to develop the glide path and to support the LTS are consistent with EPA's RHR, and interim and final EPA Modeling Guidance. EPA is proposing to find the MANE-VU technical modeling to support the LTS and determine visibility improvement for the uniform rate of progress acceptable because the modeling system was chosen and used according to EPA Modeling Guidance. EPA agrees with the MANE-VU model performance procedures and results, and that the CMAQ is an appropriate tool for the regional haze assessments for the Vermont LTS and regional haze SIP.

### **3. Meeting the MANE-VU "Ask"**

Vermont in cooperation with the MANE-VU States developed the MANE-VU "Ask" to provide for reasonable progress towards achieving natural visibility at the MANE-VU Class I

areas. The “Ask” included: (a) timely implementation of BART requirements; (b) a 90 percent reduction in SO<sub>2</sub> emissions from each of the EGU stacks identified by MANE-VU comprising a total of 167 stacks; (c) adoption of a low sulfur fuel oil strategy; and (d) continued evaluation of other control measures to reduce SO<sub>2</sub> and NO<sub>x</sub> emissions.

#### **a. Timely Implementation of BART**

Vermont does not have any BART-eligible units identified as contributing to visibility impairment in any Class I area.

#### **b. Ninety percent Reduction in SO<sub>2</sub> Emissions from each of the EGU Stacks Identified by MANE-VU Comprising a Total of 167 Stacks**

MANE-VU did not identify any additional EGU stacks in Vermont and consequently did not include any Vermont sources on the list of 167 stacks.<sup>14</sup>

#### **c. Vermont Low Sulfur Fuel Oil Strategy**

The MANE-VU low sulfur fuel oil strategy includes two phases. Phase I of the strategy requires the reduction of sulfur in distillate oil to 0.05% sulfur by weight (500 parts per million (ppm)) by no later than 2014. Phase II requires reductions of sulfur in #4 residual oil to 0.25% sulfur by weight, in #6 residual oil to 0.5% sulfur by weight, and a further reduction in the sulfur content of distillate oil to 15 ppm, all by 2018.

---

<sup>14</sup> See Appendix G – “2018 Emissions from EGUs in the Eastern US” of the Vermont SIP submittal for a complete listing of the 167 stacks.

On September 28, 2011, Vermont adopted revisions to Section 5-221, “Prohibition of Potentially Polluting Materials in Fuel,” and submitted the revised rule to EPA as a SIP revision on January 3, 2012. This rule was previously approved into the Vermont SIP. See 43 FR 59496, (Dec. 21, 1978). The revisions to the rule added the following prohibition of the sale or purchase of residual (#4, #5, and #6) and distillate oil:

(1) Beginning July 1, 2014 and ending June 30, 2018, a person may not sell or purchase No. 2 distillate oils and animal and vegetable fuel oils with a sulfur content greater than 0.05 % by weight;

(2) Beginning July 1, 2018, a person may not sell or purchase No. 2 distillate oils and animal and vegetable fuel oils with a sulfur content greater than 0.0015 % by weight.

(3) Beginning July 1, 2018, a person may not sell or purchase No. 4. residual oil with a sulfur content greater than 0.25%, and

(4) Beginning July 1, 2018, a person may not sell or purchase No. 5 and No. 6 residual oils with a sulfur content greater than 0.5% by weight.

The regulation allows for the continued use (but not sale) of fuel stored in Vermont that met the applicable sulfur content limit at the time the fuel was stored in Vermont. The regulation also allows for the use of a flue gas control to meet an emission limit comparable to the above sulfur in fuel oil limits.

The regulation allows the Governor, by executive order, to temporarily suspend the implementation and enforcement of this section if the Governor determines, after consulting with

the Secretary and commissioner of public service, that meeting the requirement is not feasible due to inadequate supply of the required fuel. In its SIP submittal for the rule, Vermont indicated that given the formal and public nature of executive orders, one would expect this authority would be used sparingly. In addition, the law specifically states that any suspension from the requirements must be *temporary*. The suspension may not be permanent or open-ended. EPA agrees that it is unlikely that this regulation would be suspended for any excessive period of time.

Finally, Vermont's revised regulation includes the appropriate recordkeeping and reporting requirements to ensure compliance with the rule.

The emission limits in Vermont's revised Section 5-221 are more stringent than the 2% sulfur by weight limit contained in Vermont's existing SIP-approved rule, thus meeting the anti-backsliding requirements of section 110(l) of the CAA. Therefore, EPA proposes that the revised rule be incorporated into the Vermont SIP.

VT DEC continues to evaluate other control measures to reduce SO<sub>2</sub> and NO<sub>x</sub> emissions. EPA proposes to find that Vermont has sufficiently addressed the applicable provisions of the MANE-VU "Ask" and has therefore demonstrated a plan to achieve reasonable progress toward natural visibility.

#### **4. Additional Considerations for the LTS**

Forty CFR 51.308(d)(3)(v) requires States to consider the following factors in developing the long term strategy:

- a. Emission reductions due to ongoing air pollution control programs, including measures to address reasonably attributable visibility impairment;
- b. Measures to mitigate the impacts of construction activities;
- c. Emission limitations and schedules for compliance to achieve the reasonable progress goal;
- d. Source retirement and replacement schedules;
- e. Smoke management techniques for agricultural and forestry management purposes including plans as currently exist within the State for these purposes;
- f. Enforceability of emissions limitations and control measures; and
- g. The anticipated net effect on visibility due to projected changes in point area, and mobile source emissions over the period addressed by the long term strategy.

**a. Emission reductions including RAVI**

No source in Vermont has been identified as subject to RAVI. A list of Vermont's ongoing air pollution control programs is included in Section III.E.1.

**b. Construction activities**

The Regional Haze Rule requires Vermont to consider measures to mitigate the impacts of construction activities on regional haze. MANE-VU's consideration of control measures for construction activities is documented in "Technical Support Document on Measures to Mitigate

the Visibility Impacts of Construction Activities in the MANE-VU Region, Draft, October 20, 2006.”<sup>15</sup>

The construction industry is already subject to requirements for controlling pollutants that contribute to visibility impairment. For example, federal regulations require the reduction of SO<sub>2</sub> emissions from construction vehicles.

MANE-VU’s Contribution Report found that, from a regional haze perspective, crustal material generally does not play a major role. On the 20 percent best-visibility days during the 2000-2004 baseline period, crustal material accounted for 6 to 11 percent of the particle-related light extinction at the MANE-VU Class I Areas. On the 20 percent worst-visibility days, however, the contribution was reduced to 2 to 3 percent. Furthermore, the crustal fraction is largely made up of pollutants of natural origin (e.g., soil or sea salt) that are not targeted under the Regional Haze Rule. Nevertheless, the crustal fraction at any given location can be heavily influenced by the proximity of construction activities; and construction activities occurring in the immediate vicinity of MANE-VU Class I area could have a noticeable effect on visibility.

For this regional haze SIP, Vermont concluded that its current regulations are currently sufficient to mitigate the impacts of construction activities. Any future deliberations on potential control measures for construction activities and the possible implementation will be documented in the first regional haze SIP progress report. EPA proposes to find that Vermont has adequately addressed measures to mitigate the impacts of construction activities.

---

<sup>15</sup> This document has been provided as part of the docket to this proposed rulemaking.



**c. Emission limitations and schedules for compliance to achieve the RPG**

In addition to the existing CAA control requirements discussed in Section III.E.1, Vermont has adopted a low sulfur fuel oil strategy consistent with the MANE-VU “Ask.” The compliance date for Phase I will be in 2014 and the compliance date for Phase II will be in 2018. EPA is proposing to determine that Vermont has satisfactorily considered emissions limitations and schedules as part of the LTS.

**d. Source retirement and replacement schedule**

Forty CFR 51.308(d)(3)(v)(D) of the Regional Haze Rule requires Vermont to consider source retirement and replacement schedules in developing the long term strategy. Source retirement and replacement were considered in developing the 2018 emission inventory. EPA is proposing to determine that Vermont has satisfactorily considered source retirement and replacement schedules as part of the LTS.

**e. Smoke management techniques**

The Regional Haze Rule requires States to consider smoke management techniques related to agricultural and forestry management in developing the long-term strategy. MANE-VU’s analysis of smoke management in the context of regional haze is documented in “Technical Support Document on Agricultural and Smoke Management in the MANE-VU Region, September 1, 2006.”<sup>16</sup>

---

<sup>16</sup>This document has been included as part of the docket to this proposed rulemaking.

Vermont does not currently have a Smoke Management Program (SMP). However, SMPs are required only when smoke impacts from fires managed for resources benefits contribute significantly to regional haze. The emissions inventory presented in the above-cited document indicates that agricultural, managed and prescribed burning emissions are very minor; the inventory estimates that, in Vermont, those emissions from those source categories totaled 4.6 tons of PM<sub>10</sub>, 4.0 tons of PM<sub>2.5</sub>, and < 0.1 ton of SO<sub>2</sub> in 2002.

Source apportionment results show that wood smoke is a moderate contributor to visibility impairment at some Class I areas in the MANE-VU region; however, smoke is not a large contributor to haze in MANE-VU Class I areas on either the 20% best or 20% worst visibility days. Moreover, most of wood smoke is attributable to residential wood combustion. Therefore, it is unlikely that fires for agricultural or forestry management cause large impacts on visibility in any of the Class I areas in the MANE-VU region. On rare occasions, smoke from major fires degrades air quality and visibility in the MANE-VU area. However, these fires are generally unwanted wildfires that are not subject to SMPs. EPA proposes to approve Vermont's decision that an Agricultural and Forestry Smoke Management Plan to address visibility impairment is not required at this time.

**f. Enforceability of emission limitations and control measures.**

All emission limitations included as part of Vermont's Regional Haze SIP are either currently federally enforceable or will become federally enforceable if this action is finalized as proposed. EPA is proposing to find that Vermont has adequately addressed the enforceability of emission limitations and control measures.

**g. The anticipated net effect on visibility**

MANE-VU used the best and final emission inventory to model progress expected toward the goal of natural visibility conditions for the first regional haze planning period. All of the MANE-VU Class I areas are expected to achieve greater progress toward the natural visibility goal than the uniform rate of progress, or the progress expected by extrapolating a trend line from current visibility conditions to natural visibility conditions.<sup>17</sup>

In summary, EPA is proposing to find that Vermont has adequately addressed the LTS regional haze requirements.

**F. Consultation with States and Federal Land Managers**

On May 10, 2006, the MANE-VU State Air Directors adopted the Inter-RPO State/Tribal and FLM Consultation Framework that documented the consultation process within the context of regional phase planning, and was intended to create greater certainty and understanding among RPOs. MANE-VU States held ten consultation meetings and/or conference calls from March 1, 2007 through March 21, 2008. In addition to MANE-VU members attending these meetings and conference calls, participants from the Visibility Improvement State and Tribal Association of the Southeast (VISTAS) RPO, Midwest RPO, and the relevant Federal Land Managers were also in attendance. In addition to the conference calls and meeting, the FLMs were given the

---

<sup>17</sup> Projected visibility improvements for each MANE-VU Class I area can be found in the NESCAUM document dated May 13, 2008, “2018 Visibility Projections” ([www.nescaum.org/documents/2018-visibility-projections-final-05-13-08.pdf](http://www.nescaum.org/documents/2018-visibility-projections-final-05-13-08.pdf))

opportunity to review and comment on each of the technical documents developed by MANE-VU.

On December 22, 2008, Vermont submitted a draft Regional Haze SIP to the relevant FLMs for review and comment pursuant to 40 CFR 51.308(i)(2). The FLMs provided comments on the draft Regional Haze SIP in accordance with 40 CFR 51.308(i)(3). The comments received from the FLMs were addressed and incorporated in Vermont's SIP revision. Most of the comments were requests for additional detail as to various aspects of the SIP. These comments and Vermont's response to comments can be found in the docket for this proposed rulemaking.

On January 15, 2009, Vermont proposed its Regional Haze SIP for public hearing and public comment. No public comments or requests for a hearing were received. To address the requirement for continuing consultation procedures with the FLMs under 40 CFR 51.308(i)(4), Vermont commits in their SIP to ongoing consultation with the FLMs on emission strategies, major new source permits, assessments or rulemaking concerning sources identified as probable contributors to visibility impairment, any changes to the monitoring strategy, work on the periodic revisions to the SIP, and ongoing communications regarding visibility impairment.

EPA is proposing to find that Vermont has addressed the requirements for consultation with States impacting Vermont's Class I areas and with the Federal Land Managers.

#### **G. Monitoring Strategy and Other Implementation Plan Requirements**

Section 51.308(d)(4) of the Regional Haze Rule requires a monitoring strategy for measuring, characterizing, and reporting regional haze visibility impairment that is representative of all mandatory Class I Areas within the State of Vermont. The monitoring strategy relies upon participation in the IMPROVE network.

The State of Vermont participates in the IMPROVE network, and will evaluate the monitoring network periodically and make those changes needed to be able to assess whether reasonable progress goals are being achieved in Vermont's mandatory Class I Areas. In its SIP submittal, Vermont is committing to continued support of the IMPROVE network for the Lye Brook Wilderness area.

Forty CFR 51.308(d)(4)(i) requires States to establish additional monitoring sites or equipment as needed to assess whether reasonable progress goals are being achieved toward visibility improvement at mandatory Class I areas. At this time, the current monitor is sufficient to make this assessment.

In its SIP submittal, Vermont commits to meet the requirements under 40 CFR 51.308(d)(4)(iv) to report to EPA visibility data for Vermont's Class I Area annually.

The Regional Haze Rule (40 CFR 51.308(d)(4)(vi)) requires the inclusion of other monitoring elements, including reporting, recordkeeping, and other measures, necessary to assess and report visibility. While the VT DEC has concluded that the current IMPROVE network provides sufficient data to adequately measure and report progress toward the goals set for the

MANE-VU Class I sites, the State has also found additional monitoring information useful to assess visibility and fine particle pollution in the region in the past. Examples of these data include results from the MANE-VU Regional Aerosol Intensive Network (RAIN), which provides continuous, speciated information on rural aerosol characteristics and visibility parameters; the EPA Clean Air Status and Trends Network (CASTNET), which has provided complementary rural fine particle speciation data at non-class I sites; the EPA Speciation Trends Network (STN), which provides speciated, urban fine particle data to help develop a comprehensive picture of local and regional sources; state-operated rural and urban speciation sites using IMPROVE or STN methods; and the Supersites program, which has provided information through special studies that generally expands our understanding of the processes that control fine particle formation and transport in the region. Vermont plans to continue to utilize these and other data -- as they are available and fiscal realities allow -- to improve their understanding of visibility impairment and to document progress toward the reasonable progress goals under the Regional Haze Rule.

#### **H. Periodic SIP Revisions and Five-Year Progress Reports**

Consistent with the requirements of 40 CFR 51.308(g), Vermont has committed to submitting a report on reasonable progress (in the form of a SIP revision) to the EPA every five years following the initial submittal of its regional haze SIP. The reasonable progress report will evaluate the progress made towards the RPGs for the MANE-VU Class I areas, located in Maine, New Hampshire, Vermont, and New Jersey.

Forty CFR 51.308(f) requires the VT DEC to submit periodic revisions to its Regional Haze SIP by July 31, 2018, and every ten years thereafter. VT DEC acknowledges and agrees to comply with this schedule.

Pursuant to 40 CFR 51.308(d)(4)(v), VT DEC will also make periodic updates to the Vermont emissions inventory. VT DEC plans to complete these updates to coincide with the progress reports. Actual emissions will be compared to projected modeled emissions in the progress reports.

Lastly, pursuant to 40 CFR 51.308(h), VT DEC will submit a determination of adequacy of its regional haze SIP revision whenever a progress report is submitted. Vermont's regional haze SIP states that, depending on the findings of its five-year review, Vermont will take one or more of the following actions at that time, whichever actions are appropriate or necessary:

- If Vermont determines that the existing SIP requires no further substantive revision in order to achieve established goals for visibility improvement and emissions reductions, VT DEC will provide to the EPA Administrator a negative declaration that further revision of the existing plan is not needed.
- If Vermont determines that its implementation plan is or may be inadequate to ensure reasonable progress as a result of emissions from sources in one or more other State(s) which participated in the regional planning process, Vermont will provide notification to the EPA Administrator and to those other State(s). Vermont will also collaborate with the other State(s) through the regional planning process for the purpose of developing additional strategies to address any such deficiencies in Vermont's plan.

- If Vermont determines that its implementation plan is or may be inadequate to ensure reasonable progress as a result of emissions from sources in another country, Vermont will provide notification, along with available information, to the EPA Administrator.
- If Vermont determines that its implementation plan is or may be inadequate to ensure reasonable progress as a result of emissions from sources within the State, Vermont will revise its SIP to address the plan's deficiencies within one year from this determination.

#### **IV. What Action is EPA Proposing to Take?**

EPA is proposing approval of Vermont's August 26, 2009 SIP revision and supplemental submittal on January 3, 2012, as meeting the applicable requirements of the Regional Haze Rule found in 40 CFR 51.308. In addition, EPA is proposing to approve Vermont's revised Section 5-221 "Prohibition of Potentially Polluting Materials in Fuel," and incorporate this regulation into the Vermont SIP.

#### **V. Statutory and Executive Order Reviews**

Under the Clean Air Act, the Administrator is required to approve a SIP submission that complies with the provisions of the Act and applicable Federal regulations. 42 U.S.C. 7410(k); 40 CFR 52.02(a). Thus, in reviewing SIP submissions, EPA's role is to approve State choices, provided that they meet the criteria of the Clean Air Act. Accordingly, this proposed action merely approves State law as meeting Federal requirements and does not impose additional requirements beyond those imposed by State law. For that reason, this proposed action:

- is not a "significant regulatory action" subject to review by the Office of Management and Budget under Executive Order 12866 (58 FR 51735, October 4, 1993);



- does not impose an information collection burden under the provisions of the Paperwork Reduction Act (44 U.S.C. 3501 *et seq.*);
- is certified as not having a significant economic impact on a substantial number of small entities under the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*);
- does not contain any unfunded mandate or significantly or uniquely affect small governments, as described in the Unfunded Mandates Reform Act of 1995 (Public Law 104-4);
- does not have Federalism implications as specified in Executive Order 13132 (64 FR 43255, August 10, 1999);
- is not an economically significant regulatory action based on health or safety risks subject to Executive Order 13045 (62 FR 19885, April 23, 1997);
- is not a significant regulatory action subject to Executive Order 13211 (66 FR 28355, May 22, 2001);
- is not subject to requirements of Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (15 U.S.C. 272 note) because application of those requirements would be inconsistent with the Clean Air Act; and
- does not provide EPA with the discretionary authority to address, as appropriate, disproportionate human health or environmental effects, using practicable and legally permissible methods, under Executive Order 12898 (59 FR 7629, February 16, 1994).

In addition, this rule does not have tribal implications as specified by Executive Order 13175 (65 FR 67249, November 9, 2000), because the SIP is not approved to apply in Indian country

located in the State, and EPA notes that it will not impose substantial direct costs on tribal governments or preempt tribal law.

**List of Subjects in 40 CFR Part 52**

Environmental protection, Air pollution control, Carbon monoxide, Incorporation by reference, Intergovernmental relations, Lead, Nitrogen dioxide, Ozone, Particulate matter, Reporting and recordkeeping requirements, Sulfur oxides, Volatile organic compounds.

**AUTHORITY:** 42 U.S.C. 7401 et seq.

Dated: February 13, 2012

Signed: H. Curtis Spalding,  
Regional Administrator,  
EPA Region 1

[FR Doc. 2012-4683 Filed 02/27/2012 at 8:45 am;  
Publication Date: 02/28/2012]